REMARKS/ARGUMENTS

A listing of claims is provided for the Examiner's convenience.

Claims 10-14 are withdrawn.

Claims 1-9 are pending in the application.

Applicants respectfully traverse the 35 U.S.C. 102(e) rejection of Claims 1-4, 6-7, and 9 in view of US 6,697,412 (Beam). Applicants assert that Claims 1-4, 6-7, and 9 are different from Beam and are, therefore, patentable.

The Office has asserted, in part, that Beam describes an indium arsenide layer 16 disposed on a gallium arsenide substrate 12 (Official Action, page 2, paragraph 3) and used this assertion to reject Claims 1-4, 6-7, and 9. Applicants submit that the layer 16 disposed on the gallium arsenide substrate 12 of Beam differs for the indium arsenide layer disposed on the gallium arsenide substrate of the present invention for the following reasons:

The indium arsenide layer of the present invention:

1) is composed of indium arsenide;
2) is constant in composition; and
3) has a lattice constant that significantly differs from the lattice constant of the gallium arsenide substrate;

In contrast, the buffer layer 16 of Beam:

1) is essentially aluminum arsenide, not indium arsenide, at the interface between layers 12 and 16;
2) varies in composition with distance from the interface of the layers 12 and 16; and
3) has a lattice constant, in the aluminum arsenide portion of layer 16, that matches the lattice constant of the gallium arsenide substrate layer 12.

Further, the lattice constant of the indium arsenide layer of the present invention is significantly different from the lattice constants of the layers between which it is sandwiched.

Conversely, layer 16 of Beam is graded and has two lattice constants that, respectively at each layer interface, match the lattice constants of the two layers between which it is sandwiched.

For all of the above-stated reasons, Applicants submit that the present invention is different from Beam and that the 35 U.S.C. 102 (e) rejection should be withdrawn.

Support for Applicants' description of Beam is as follows:

Figure 1 of Beam describes a metamorphic buffer layer 16, composed of n-$In_xAl_{1-x}As$, disposed on the gallium arsenide substrate 12. The elemental composition of layer 16 of Beam varies with distance from the interface of the layers (Column 3, lines 1-2). At the interface of layers 16 and 12 of Beam, the elemental composition of the layer 16 is essentially aluminum arsenide, not indium arsenide (Column 4, line 15, x=0 so: $In_xAl_{1-x}As = In_0Al_{1-0}As = AlAs$). That layer 16 is graded and has two lattice constants that, respectively at each layer interface, match the lattice constants of the two layers between which it is sandwiched, is found at column 3, lines 1-12.

Support for Applicants' description of the present invention is as follows:

That the layer disposed on the gallium arsenide substrate is indium arsenide and has a constant layer composition: page 7, line 12;

That the indium arsenide layer differs in lattice constant from the gallium arsenide substrate layer: page 9, lines 1-4, gallium arsenide substrate lattice constant = 0.5653 nm, indium arsenide lattice constant = 0.6058 nm;

That the indium arsenide lattice constant also differs from the other (e.g., indium phosphide) layer between which it is sandwiched: page 9, lines 1-3, indium phosphide lattice constant =0.5968 nm.

The Office has also rejected Claims 5 and 8 under 35 U.S.C. 103 (a) as being unpatentable over Beam in view of Azuma (US 6,661,038). Applicants traverse the rejection because the combination of Beam and Azuma would not result in the Applicants' invention.

Specifically, the buffer layer of the combination of Beam and Azuma would be graded and possess two lattice constants that, respectively at each layer interface, would match the lattice constants of the two layers between which the buffer layer is sandwiched.

In direct contrast, Applicants' buffer layer is not graded and possesses a single lattice constant that does not match the lattice constants of the two layers between which the buffer layer is sandwiched. Withdrawal of the 35 U.S.C. 103 (a) rejection is requested.

Applicants earnestly solicit early notification that the claims have passed to issue.

Respectfully submitted,

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